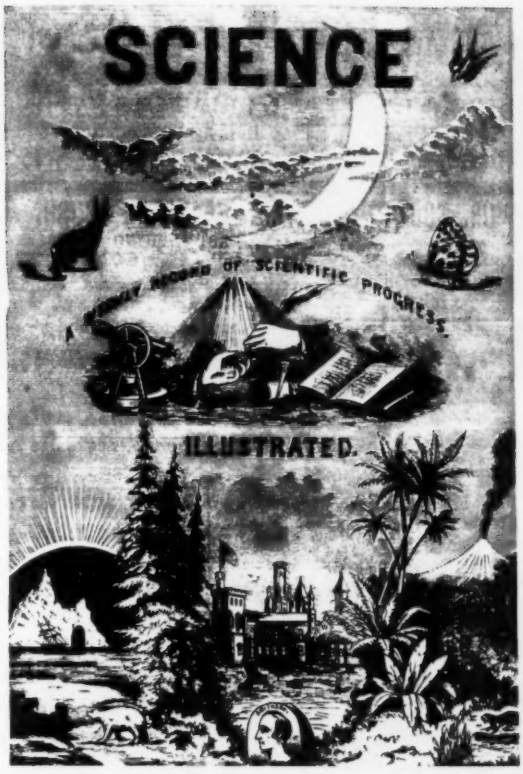
AAAS Bulletin

American Association for the Advancement of Science

July 1961



Our 81-Year-Old Weekly

► In the face of a marked general decline in industrial advertising over the first half of this year, SCIENCE continued to gain advertising pages. A total 834 pages in the first half of 1961 represents an increase of 20 per cent over the same period last year.

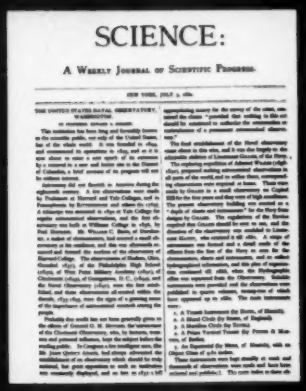
Thus 1961 promises to be the sixth year of uninterrupted gain in both advertising pages and revenue for our magazine. Not only have advertising pages increased in every year since 1955, but the rate of increase has been high in each year.

Our 81-year-old weekly's robust health also contrasts with declines which some of the young giants among consumer magazines suffered last year. While most magazine publishers apprehensively gauged the inroads of TV, now said to be in 88 per cent of U. S. homes, the AAAS, as publisher of SCIENCE, could celebrate a novel turn of events. In 1960 advertising revenue exceeded the printer's bill for SCIENCE for the first time in recent years. This was the result of a 15 per cent gain in advertising pages over 1959.

SCIENCE's booming present circulation of 70,000 would have been no surprise to Alexander Graham Bell and the small group of energetic scientists who, foreseeing the great growth of science in the U. S., got together in 1883 to issue the magazine from Harvard Square. These optimistic gentlemen managed to revive the scientific weekly which had been founded by Thomas Edison in 1880 only to expire quietly in March 1882, just after reporting at length on the multitude of animal organisms to be found in New York's water supply.

Edison's SCIENCE, published every Saturday from the Tribune Building in New York, had little to say about itself at any time and nothing at all about the reason for the sudden end of its brief but interesting life. It made its bow with scarcely more than the modest hope that "those engaged in Scientific Research" would "make this Journal the medium of reporting their work," turned quickly to a lecture by Thomas Huxley on "The Coming of Age of the Origin of Species" and to refutation of the report of a gas lighting journal that Mr. Edison had thrown up his electric light researches and left for California. Carbon-electric lights at Menlo Park were promised within a few weeks, SCIENCE said.

Bell and his associates were more expository. While Bell's hope was to achieve an American equivalent of *Nature*, the weekly which Sir Norman Lockyer with Darwin, Tyndall and Huxley had brought out in 1869, his first issue reflected a different turn of mind. The lead article spoke with late 19th century exuberance of the "utilitarianism of American science" and cited the "un-



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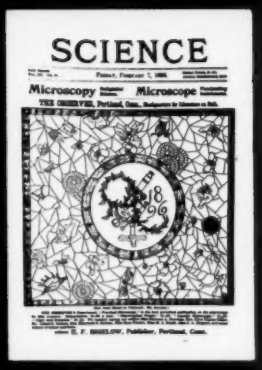

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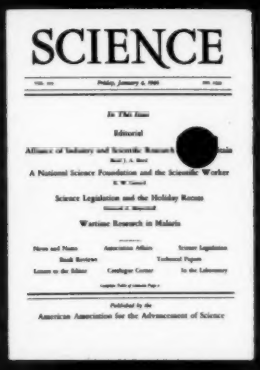


1946

rivalled telescopes of Alvin Clark," "the perfection to which Tolles has brought his object-glasses", and the "exquisite gratings of Rowland." The anonymous editor foresaw a golden harvest in the century ahead in "those sciences whose principles are capable of useful cultivation" and said that "the liberality with which research has been endowed in America has been the astonishment of men of science in other countries."

Although Bell, together with Gardiner G. Hubbard, invested about $75,000 in an effort to make SCIENCE self-supporting, this did not occur. The editor, N. D. C. Hodges, took over financial responsibility and made a last desperate effort to keep the magazine afloat. Among the sober notices of microscopes and scientific books, strange new advertising appeared. "Crosby's Vitalized Phosphites" for treating brain starvation were billed as being used by a number of prominent professors. Not long after the alarming offer of "Dr. Hart's bottle of medicine" (see cut), SCIENCE again expired, this time in March 1894.

Better times were ahead. That academic dynamo, J. McKeen Cattell, at 31 head of Columbia's Department of Psychology, was then confidently expected by many of his colleagues to leap to first place in the new and characteristically American science of pragmatic psychology. Instead, Cattell chose to divert some of his remarkable energies to founding a publishing and business empire, which eventually included seven scholarly periodicals (each edited on a different day of the week from the Cattell home at Garrison, N. Y., with the entire family at work), as well as *American Men of Science,* and the Psychological Corporation.

Cattell had a nonacademic gift for both psychology and financial management, and he apparently secured some support for a revival of SCIENCE from the MacMillan Co., whose British house had published *Nature* at a loss for many years. He also organized a strong editorial committee which included some of the leading scientists of the day and in which he appeared, not as chairman but merely as member. In these promising circumstances, SCIENCE in January 1895 resumed a publication that has never since been interrupted.

In the lead article of the first issue, the gifted astronomer and mathematician Simon Newcomb suggested that the weekly would provide the "attrition of like minds" which he found "almost as necessary to intellectual production as companionship is to conversation."

There were other aims. D. C. Gilman, president of the Johns Hopkins University and president of the earlier company organized by Bell to publish SCIENCE from Harvard Square, now appeared as a member of the new editorial committee and offered a word of advice that is by no means out-of-date:

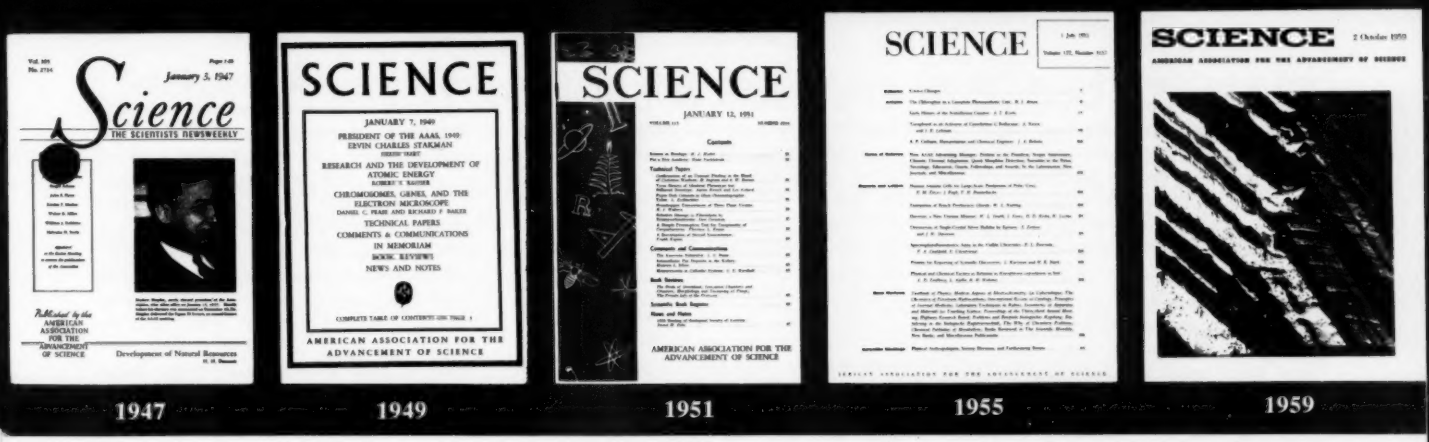
"No better writers of instructive and agreeable English can be wished for than Darwin, Tyndall, Huxley and Spencer. SCIENCE hopes to be so fortunate as to discover and awaken the desired talent among American students of nature. . . . Its managers know the rocks and shoals that must be avoided. . . . They believe that the art of writing can be acquired. One of the fundamental canons of success is to write so clearly that the rapid reader can perceive what is meant."

Becomes Property of AAAS

In 1900, at its annual meeting, the AAAS voted to arrange a contract with the MacMillan Co. under which SCIENCE would be sent to its 1,925 members at no charge to each. (It was at the same meeting that AAAS invited the specialized national scientific societies to meet in conjunction with its Annual Meeting.) The magazine did not become the property of the AAAS until 1944, at the death of Dr. Cattell and under a purchase agreement which he had made with the Association in 1938.

Until 1958 members could choose between receiving the weekly SCIENCE and *The Scientific Monthly,* which had also been sold to AAAS by Cattell. In that year the two magazines were combined and SCIENCE carried 2,156 editorial pages. The number of editorial pages (i.e., pages of text exclusive of advertising) has increased in every year since and is expected to reach 2,475 in 1961.

An editorial staff of 14 produced the enlarged SCIENCE of 1958, and although the magazine has continued to grow in both advertising and editorial pages and in circulation, the staff has not. At its meeting in May, the AAAS board of directors approved proposals to increase the staff and add other services that will help SCIENCE con-



tinue to improve the breadth and balance of its weekly report on scientific advance.

An interesting range of factors has been mentioned as accounting for SCIENCE's steady gain in advertising pages. According to the advertising agency set, it may be the result of what these folks are calling the "U. S. cultural explosion." While the mass magazines seem to be fading in the glare from the 24-inch screen, "class" magazines have been steadily picking up advertising pages. Examples: the *New Yorker* which, according to the *Gallagher Report,* led the advertising scoreboard with 5,315 pages last year; the *Reporter,* up 73 per cent; *Harper's Magazine,* up 22 per cent; the *Atlantic,* up 19 per cent.

It has also been suggested that the rate of gain in advertising may reflect what economists call an "early growth" stage. This is supported by comparing our 1960 page gain of 15 per cent with the drop of —9.1 per cent for the A.M.A. *Journal* and the increase of 0.7 per cent for the American Chemical Society's *Chemical and Engineering News* as reported by Gallagher. It is not, of course, our objective to emulate the commercial success of the A.M.A. *Journal* (which stands third* among all business and professional publications listed by Gallagher with a gross advertising revenue of $7,433,228 and 5,827 pages last year) or of *Chemical and Engineering News* (gross advertising revenue—$3,507,805; pages—3,233.)

SCIENCE's increase in circulation (from 58,857 in 1958 to the present 70,000) is, of course, a basic factor in the advertising gain. Surveys have indicated that the magazine is not only circulated but read with an interest that seems to increase each year.

Since 1880 the publishers of SCIENCE have been asking the readers to "kindly mention our name to the advertisers", and the present managers are no exception. Of course what we hope you will do is mail in the "bingo" card. This is the card bearing numbers that appears once a month in your weekly copy of SCIENCE; you will have noted that these copies are unusually heavy with advertising. Because some 60 per cent of publications used by industrial advertisers do not have audited circulations (SCIENCE circulation has been ABC-audited since 1956), advertisers have acquired an affinity for the bingo card. In case you haven't, may we advise that the numbers refer to the page number and position of specific ads. Circling those in which you are interested and mailing the card will bring you product literature. The plan may be a little tedious, and readers often prefer inquiring about products by letter to using the card. Please do either, or both, but if you write a letter, "kindly mention our name," etc. Until advertisers modify their present

SCIENCE COVERS THROUGH THE YEARS (above) show many design changes. Except for 1959, change in format usually signalled advent of a new editor. Note stability from 1896 to 1946, reflecting long period of Cattell ownership. Alarming ad below ran in 1888. Illustration on page one was part of 1880 house ad.

Look Here, Friend. Are you Sick?

Do you have pains about the chest and sides, and sometimes in the back? Do you feel dull and sleepy? Does your mouth have a bad taste, especially in the morning? Is there a sort of sticky slime collects about the teeth? Is your appetite poor? Is there a feeling like a heavy load on the stomach, sometimes a faint, all-gone sensation at the pit of the stomach, which food does not satisfy?

Are your eyes sunken? Do your hands and feet become cold and feel clammy? Have you a dry cough? Do you expectorate greenish colored matter? Are you hawking and spitting all or part of the time? Do you feel tired all the while? Are you nervous, irritable and gloomy? Do you have evil forebodings? Is there a giddiness, a sort of whirling sensation in the head when rising up suddenly? Do your bowels become costive? Is your skin dry and hot at times? Is your blood thick and stagnant? Are the whites of your eyes tinged with yellow? Is your urine scanty and high colored? Does it deposit a sediment after standing? Do you frequently spit up your food, sometimes with a sour taste and sometimes with a sweet? Is this frequently attended with palpitation of the heart? Has your vision become impaired? Are there spots before the eyes? Is there a feeling of great prostration and weakness? If you suffer from any of these symptoms, send me your name and I will send you, by mail,

One Bottle of Medicine FREE

Send your address on postal card to-day, as you may not see this notice again.

Address, naming this paper, Prof. HART, 88 Warren St., New York.

* Topped only by *Business Week* and *Fortune.*

faith in the bingo card as the ultimate measure of response to advertising in our magazine, it will be very helpful if members, who are characteristically responsible for sizeable purchases of research and production equipment, will clearly identify their interest in specific products with advertising in their own magazine.

While summertime just isn't what it used to be, we nevertheless hope that you may find yourself with a little more time than usual for catching up with SCIENCE. We think you will agree that the changes made over the last five years under Dr. Graham DuShane's editorship are adding up to a substantial improvement: a more attractive and legible format, clearer writing, the introduction of up-to-date reviews of new research directions (Current Problems in Research) and of the new tools of science (Instruments and Techniques). In short, we hope you will feel satisfied that the magazine is doing better than ever at the job it set out to do. This, in the words of an editor of an earlier and less crowded century, is to keep you fully informed of "the exact position of the ever-varying line that marks the limits of the known."

Fact Glut

► The rate at which the facts of science are increasing has suggested to many that the next major advance of science must come in the field of communication. Even within a single discipline, the investigator today can scarcely hope to sort out, appraise and absorb from a mountain of new facts those that are relevant to his own research problems. When the question is enlarged, as it now must be, to include work stretching across the traditional boundaries of a dozen disciplines, the problem of communication takes on staggering proportions.

Technological imagination of a high order will be required before the various sciences can move on to the fundamentally enlightening syntheses that we can now sense are not far ahead of us. John H. Wilson, writing in SCIENCE 14 October 1955, suggested that scientific communication would have to be provided in the direct manner of a telephone conversation—that is, the technology would have to be devised to permit a single mind to examine directly and efficiently whatever an X number of other minds had to say about the subject of his interest.

The National Science Foundation recently published the eighth semiannual issue of *Current Research and Development in Scientific Documentation.* No less than 195 studies are reported: studies on storage and retrieval systems and the mechanical or electronic equipment to facilitate storage and retrieval of printed information, on mechanical translation, and on kindred problems. A librarian's problems have become very different from those when the library of Pantainos, built in Athens about 100 A.D., warned users that "No book shall be taken out for we have sworn it. It will be open from the first hour until the sixth." Many of those working on communication would like, as a minimum goal, to amend this ancient rule to read: "No book shall be taken out for we have installed a system that will give you your own copy of any portion of any publication to be found in this or any associated library."

The general concern for an approach to this problem has helped to stimulate requests for the establishment of a new section on "Information and Communication" in AAAS. The section would provide a forum in which scientists from the different disciplines could join communication specialists in working on the matter. The Board of Directors has agreed to recommend the establishment of such a section to the Council, which will act on the recommendation at the Annual Meeting next December.

This growing field is, of course, already represented by a number of professional societies. Those affiliated with AAAS are:

- American Documentation Institute
- American Library Association
- American Medical Writers' Association
- Association for Computing Machinery
- Bibliographical Society of America
- Kresge-Hooker Science Library Associates
- Linguistic Society of America
- National Association of Science Writers
- National Federation of Science Abstracting and Indexing Services
- Special Libraries Association

Royal Tradition

► Christmas lectures for children given each year in London by the Royal Institution of Great Britain have been famous for over a century. Recently in New York the Rockefeller Institute has offered a similar series; Rene Dubos was lecturer in 1959 and Paul Weiss last year. For a number of years the Washington Philosophical Society has arranged lectures for high school students, last year presenting George Beadle.

Officers of AAAS and the National Science Foundation have decided to extend this fine idea by offering a series of perhaps five lectures in ten cities. Each series will be given by a distinguished scientist, and with the aid of excellent film or other demonstration. AAAS will manage the program, and NSF will supply the funds. The planners are agreed that no effort will be spared to make sure that these series reach a high level of excellence. Most of the lectures will probably also be published in book form.

AAAS Bulletin

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No. 3

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The American Association for the Advancement of Science, founded in 1848, offers membership both to professional scientists in all fields and to other men and women who have a general interest in science and who recognize its relation to human welfare.

Annual membership dues are $8.50. Each member receives the *Bulletin* and *Science,* the scientific newsweekly established by Thomas A. Edison in 1880. *Science* includes reports of original research across the spectrum of the physical and biological sciences as well as news of scientists and their work.

Chauncey D. Leake, Past President and Chairman of the Board

Thomas Park, 1961 President

Dael Wolfle, Executive Officer

Better Education for Science Teachers is Ahead

► More than 20 years ago the American Chemical Society complained that certification requirements for high school teachers would prevent "even Nobel Prize winners in science from teaching in many high schools." Educators replied by doubting that many Nobel Prize winners would indeed have what it takes to get the elementary facts of science into the heads of high school students.

The hot controversy of the thirties quietly cooled sometime in the forties. By the end of the war, it was apparent that the new facts of science were accumulating at such a rate that neither scientists nor educators could any longer muster complete assurance on questions of what to teach, and how and when.

Over recent years the state officers responsible for licensing teachers have been doing some hard thinking on this complex matter. Two years ago they set up a study to devise methods of certification that would improve the quality of science and mathematics teaching in the high schools. Last month, with justified enthusiasm, they voted to accept the certification guidelines produced by their study group.

The guidelines adopted by the National Association of State Directors of Teacher Education and Certification at their annual meeting promise substantial improvement in the education of teachers of science and mathematics. In this case, the promise is not likely to remain merely on paper, as so many intelligent and hopeful proposals in the field of education do. The chances for rapid and overdue change in this sector of the education front are excellent, and this is the direct result of the remarkable network of organizations and individuals, all concerned with the quality of teaching, which the state directors were able to assemble and use to deal with this many-sided question.

AAAS is Working Partner

We are glad to report that the AAAS has been in partnership with NASDTEC in this enterprise from the very beginning. The state directors were clear from the start on just what they wanted to do: They wanted to put the responsibility for saying who shall teach where they thought it belonged—in the hands of the schools that prepare teachers for their lifework. They wanted to use their own resources to evaluate the quality of the entire job being done to educate teachers instead of for a superficial adding up of hours and credits earned by individual candidates. And they wanted to get scientists and educators together in hewing out the main lines of improved programs for the education of teachers.

The state directors thought we could help because they were aware that the AAAS work in education is based on a single premise that can be simply stated: Scientists know the subject matter of science. Educators know children and how to manage schools. Nothing lasting and significant can be done to improve science instruction in the schools and colleges unless both groups understand each other and work together.

NASDTEC had also enlisted the interest of the Carnegie Corporation of New York, which has been continuously concerned with the quality of American education since the days when Abraham Flexner found that many U. S. physicians had scarcely more education than that of a good horse doctor. The Carnegie Corporation was particularly interested in the central problem of professional licensing by the states—indeed, the key problem of all organized attempts at standard-setting: how to pull the weeds of incompetence without cutting away the start of new growth. Many members will remember the Commission on Medical Education study supported in part by Carnegie 30 years ago, whose effects were almost as far-reaching as those of the famous Flexner report. Among them: state medical boards stopped prescribing what medical curriculums should be and left medical schools free to move on to new levels of scientific scholarship.

Where Can a Licensed Teacher Teach?

This is what the state certification directors hoped to achieve in the education of high school science teachers, and it is notable that this time the movement for reform came from within the ranks of the state regulators themselves rather than from the outside as in the case of the medical boards.

When they began their work, the state directors confronted a national pattern of considerable diversity. There had been a general upgrading of certification standards; for example, all the states were by that time requiring the bachelor's degree for high school teaching and four were requiring the master's degree. Over half the states had already shifted to a more flexible and comprehensive basis for licensing teachers. In these states, education officers review and approve, not individual records of hours and courses, but the character and quality of instruction offered by the colleges of teacher education. It is the job of the state directors to evaluate and accredit the schools themselves. On this basis, graduates recommended by accredited schools become eligible for teaching licenses.

But many states still say that nobody can teach in a public school unless he can present a specified number of semester hours in a specified list of courses. The detail with which such certification requirements are written assures inconvenient variation from state to state; thus a chemistry teacher approved by Massachusetts may find he can't get a job in Ohio without going back to school. The specification method has the even more serious disadvantage of preventing teacher education institutions from changing their programs of instruction when they think improvement is needed.

Among the states which still spell out required courses and hours, education courses are more likely to be specified in detail than subject matter courses. Sometimes this means that if a candidate presents 20 hours in education, nobody looks very carefully at what he knows about, say,

The Sciences and the Humanities

by

CHAUNCEY D. LEAKE, Past President

Let's take a minute to consider the reciprocal relations between the sciences and the humanities. This matter is too often lightly dismissed with a sort of compassionate smile—surely, we say, everyone already knows and understands all about it. Nevertheless, the problem remains, as Sir Charles Snow has so forcefully reminded us. Why should scientists and humanists work together in this critical time for the sharp, hard, and bold planning for the future that is so essential for the welfare of us all?

The concept of science implies that wise policy decisions for human welfare are greatly aided by the availability of verifiable knowledge about a given problem. On the other hand, the humanities give us the background for judgment. The sciences are concerned with assembling the "facts" about ourselves and our environment, by a method which involves self-criticism and self-correction. The humanities are concerned with moral and esthetic values. It is in the humanities that we find the basis for appraising human experience. Here, in the long panorama of man's life on earth, we must discern and select the values that are the ultimate measure of the quality of our lives: the ends for which we shall decide to apply all the abundant new means of science.

In our educational programs and for intelligent social participation at all times, the sciences and the humanities must be in balance. It is no longer seriously contended that scientists must be free to pursue the "facts" of nature without reference to the values of human life. In science as elsewhere choices must be made, and the very ability to choose is a human quality. While our own anxieties may urge us to surrender this essentially human ability to some future IBM machine, we must accept the strong probability that healthy human emotions are the indispensable basis for objective assessment of available facts and known uncertainties. We know that healthy emotions grow from a sense of relatedness—both to the other men and women who share our own precarious time and to the marvelous phenomenon of human history: the increasing degree to which a living chemical system is succeeding in transforming the conditions which for two billion years have threatened its survival on this planet.

When the sciences and the humanities are used like the two eyes of man's remarkable bifocal vision, we can expect that we shall be able to discern much wiser policy decisions at the various social levels than we can when these two major dimensions of human experience are isolated from each other. As you all know, AAAS is alert to this need and maintains both the Committee on Science in the Promotion of Human Welfare and an active membership section concerned with the history and philosophy of science. Distinguished humanists from time to time might be invited to the sessions of these groups to our mutual benefit.

Better Education

Continued from page five

history or math. Some states still give blanket certificates with no specification of the subject matter in which the teacher is prepared.

Even among the states already using the school-accrediting method, there have been plenty of uncertainties. What, indeed, should teachers be taught? In mathematics and the sciences, where the crowding new facts have washed away most of the familiar teaching landmarks, the question is a particularly difficult one.

Part of the difficulty is that a first-rate elementary science course demands insight and education of a high order from the teacher; as anyone knows who has tried it, accurate simplicity in scientific description is usually the result of profound understanding that is not common. Yet it is just this sort of understanding that the teacher must have to capture the interest of the beginning student and to suggest that a scientific discipline is more than a crowded catalog of facts. As if this sort of problem—inherent in the rapid growth now underway in almost all fields of science—were not enough, there is also the regrettable fact that many high schools cannot afford to hire teachers who are specialists in a single subject and look instead for jacks-of-all sciences or even someone who can also coach basketball. And there is also the wide-open question of whether it is better to keep on teaching "general science" in the 9th grade or to begin a specialized subject.

Agreement Between Scientists and Educators

It was in the face of these and other dilemmas that the men responsible for teacher certification sat down to secure a wide agreement on standards that would free the colleges and universities to move toward excellence in teacher education. In this they were successful, and the guidelines do indeed represent a basic agreement between subject matter specialists and specialists in education.

As approved, the guidelines recommend thorough education in the subject to be taught, and they urge all states to shift teacher certification from a quantitative to a qualitative basis. They outline the recommended content of a teacher's education in six fields: biology, chemistry, physics, mathematics, physical science and "junior high school" or "general" science. The guidelines are intended for use by state certification officers as a basis of appraisal in accrediting teacher education institutions.

In recommending the guidelines for use by the states, NASDTEC also went on record against watered-down subject matter courses for science teachers. The teachers, they said, "should receive basic fundamental preparation in course content in each science, the same as that for the preparation of any scientist." Nor should their education omit the "philosophical problems which arise in the perception of science and mathematics as humanistic disciplines."

"The subject matter department should participate in the methods courses, the supervision of student teaching, and the decision to recommend the student for certification as a high school teacher."

Thus the door is open at last for wholesale improvement by colleges and universities of curriculums offered for the education of science teachers. Those who prepare to be teachers will have a chance to achieve professional status in science as well as in teaching. Teachers' science courses will be redesigned to cover the new findings of science, and there is now a real opportunity for the science and mathematics departments to share in designing them. The new courses will be aligned in content with the new secondary school courses in science and mathematics which have been prepared by the various scientific study groups under the sponsorship of the National Science Foundation. One of the first results of the rejuvenated college programs will be that teachers entering the profession will be prepared to teach these courses; as things now stand, even recent graduates usually find it necessary to supplement their background in science before introducing them.

Around the Conference Table

All this is the result of an undramatic and tedious democratic process. The guidelines represent the work, not only of the National Association of State Directors of Teacher Education and Certification, but also of such decisive influences as the American Association of Colleges of Teacher Education; the National Commission on Teacher Education and Professional Standards (organized by the National Education Association in 1946); the National Council for Accreditation of Teacher Education (formed in 1952 by the American Association of Colleges of Teacher Education); the Council on Cooperation in Teacher Education (appointed by the American Council on Education); the Council of Chief State School Officers and others.

This formidable list of associations traded the fun of arguing in print for the hard work of a long series of national and regional conferences, where they shared differing views not only with each other, but with scientists from many disciplines, scientists who had worked on the new secondary school curriculums, public school teachers and administrators, and members of the education, science and mathematics faculties of a number of colleges.

The Carnegie Corporation of New York's grant of $81,000 to finance the teacher preparation and certification study was made directly to the AAAS, and the NASDTEC study was carried on from the AAAS headquarters office under the joint direction of John Mayor, AAAS director of education, and of William P. Viall, formerly chief of the

Continued on page eight

To the Membership:

Shortly after I became President of the AAAS I wrote our Executive Officer, Dael Wolfle, a polite but pointed note in which I asked him to summarize for me some of the significant activities now being carried on by our Association. Dr. Wolfle's reply was so informative that I have persuaded him to reprint below his answer to my request so that all readers of the *Bulletin* can be as much rewarded as was I.

THOMAS PARK
President

Dear Tom:

You asked for a brief statement of AAAS activities.

Our most important activities are the continuing ones—the weekly publication of SCIENCE and the Annual Meeting.

The 1960 meeting was the largest in the Association's history. Of greater importance is the fact that there were, I think, more compliments about its content than about any other in recent years. A notable feature was the Symposium on the Sciences in Communist China. (The symposium volume was published on June 30.)

Frequently overlooked or unknown to members in the eastern part of the United States are our three regional meetings—in the Southwestern and Rocky Mountain Division, the Pacific Division, and the Alaska Division. These are smaller meetings, but they are fun.

We have resumed publication of the membership bulletin on a quarterly basis.

The Traveling Library of Science is going to 1,700 high schools, and the Elementary Library to 800 elementary schools. The 1961-62 program will be on the same scale.

The lists of recommended science books put out as an adjunct to the Traveling Libraries continue to be widely used as acquisition guides and in a number of states have been adopted as official lists for school purchases under the National Defense Education Act.

Under John Mayor's direction, we are in the second year of an "experiment" in four regions, comparing the effectiveness of special teachers of science and mathematics in the upper elementary grades with the effectiveness of the regular classroom teacher in handling those subjects.

Also in its second year is a program of small research-supporting grants to faculty members in relatively poor and usually teacher-training colleges intended to give prospective science teachers a little contact with actual scientific research.

The Association has held three conferences in St. Louis, Berkeley and Washington on the possibilities of improving the teaching of science in the elementary grades and junior high schools. Recommendations were published in SCIENCE 23 June 1961 and were transmitted to the National Science Foundation. There was a surprising amount of interest on the part of scientists in these meetings, and a surprising expression of willingness to work with elementary teachers on the task of improving elementary science instruction and materials.

We continue to handle annually for NSF a program of selecting several hundred high school teachers of science and mathematics who are well enough educated in these fields to be ready for independently planned graduate work in their disciplines.

We are arranging a special program for the American Society of News-

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Teacher Certification

Continued from page seven

bureau of teacher education and certification of the state of New York. H. Bentley Glass, professor of biology, the Johns Hopkins University, and E. G. Begle, associate professor of mathematics, Yale University, represented the AAAS on the study advisory board.

The AAAS Cooperative Committee on the Teaching of Science and Mathematics can also be credited with groundbreaking in the thorny matter of certification change. The Committee, which has been at work since 1946, made specific recommendations in each science teaching area. These, as published in SCIENCE 8 April 1960, were influential in shaping the guidelines adopted by NASDTEC.

The Carnegie Corporation recently announced a second grant of $100,000 for a two-year continuation of the teacher preparation and certification study. This will be used to aid states in making use of the guidelines, to counsel with colleges on science and mathematics programs for teacher education, and to develop comparable guidelines for the preparation of elementary school teachers.

To the Membership

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paper Editors at which Harlow Shapley, Francis Schmitt, Warren Weaver, Frank Press and Frank Brown will address the editors on scientific topics. (The program was held April 19.)

The Committee on Science in the Promotion of Human Welfare is undertaking a study that should eventuate in a report for popular distribution on the atmosphere as a natural resource and the things that man is doing that may interfere with its conservation.

Cooperatively with the National Association of State Directors of Teacher Education and Certification, we are carrying out a study of the actual qualifications in their subject matter of a good statistical sample of secondary school teachers of science and mathematics, and also a study of standards of certification of such teachers (see page 5).

The Association's finances are in sound condition.

DAEL WOLFLE
Executive Officer

From Cyrillic to Roman

► How to convert the 48 letters of the Cyrillic alphabet in which Russian scientists write to the 26 letters of the Latin alphabet in which we write is one of the blocks to better scientific communication across political boundaries. Three different systems of transliteration are in use in the U. S. This has led to substantial confusion, which many, and especially the British, who have the advantage of a uniform system, would like to see cleared away. AAAS invited some 30 experts to Washington in mid-July to see what can be done to secure agreement among transliterators on a uniform system.

Visiting Scientists

► In late June AAAS brought together in Washington 18 scientists and mathematicians from Denmark, England, Germany, India, Norway, Peru, Sweden and Switzerland for three days of discussion of the summer institutes which science and mathematics teachers are attending in several hundred American colleges and universities. After the orientation session, the visiting scientists left to rotate among the summer institutes where they will lecture and lead seminars. This is the third year the National Science Foundation has sponsored such scientific visits, but the first in which AAAS has been responsible for managing the program.

This year's visitors were all chosen by AAAS both for ability to present new findings in a field of science and for interest in the problems of secondary education. They are:

Hermann Athen, headmaster, Bismarckschule, Hamburg, W. Germany; Gunnar Bergendal, University of Lund, Sweden; John Brierley, H. M. Inspector of Schools, Ministry of Education, England; W. M. Brookes, Southampton University, England; Harry Garms, Institute for Advanced Teacher Training, W. Germany.

Sven Glad, the Higher Teacher Training College of Malmo, Sweden; Herbert Halliwell, University College of North Staffordshire, England; Frans Handest, Denmark Highschool for Teacher Training; Walter Knutel, Gymnasium Hamburg, W. Germany; Walter Langford, headmaster, Battersea Grammar School, England; Banarsi Laroia, University Grants Commission, India.

Helge Larsen, the Technical University of Norway; Sven W. Lennander, University of Lund, Sweden; André Mercier, University of Bern, Switzerland; Lars-Olof Ohman, Norra Real Senior High School and College, Sweden; Peter Sykes, Christ's College, Cambridge, England; José Tola Pasquel, University of San Marcos, Peru; Barry Trapnell, headmaster, Denstone College, England.

Membership Boom

► New members have joined AAAS at an average rate of over 1,000 a month for the last year, and membership now stands above 65,000. You may wish to bring the many advantages of AAAS membership to the attention of those of your associates who do not already belong. Membership is open not only to professional scientists but also to other men and women who have an interest in science and are concerned with its relation to human welfare. Let's make a particular effort to enlist the interest of young men and women at the beginning of their careers. Strong new interest of this sort is essential for the continuity of our work, now in its 113th year.

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